Magnitude 7 Metals LLC

STACK SAMPLE RESULTS

POTROOM
LINE 1 BA

Run Number 1 | 4/29/2020 | EPA Method # 13

METER VOLUME	270.914	CU. FT.
SQUARE ROOT OF DELTA P	0.698	SQ. ROOT IN. WATER
AVERAGE DELTA H	1.764	IN. WATER
METERED GAS TEMPERATURE	74.66	DEG. F
STATIC PRESSURE IN STACK	-0.43	IN. WATER
STACK TEMPERATURE	169.8	DEG. F
BAROMETRIC PRESSURE	29.41	IN. Hg
PROBE TIP DIAMETER	0.2534	INCHES
GAS METER CORRECTION FACTOR	0.989	
TOTAL SAMPLING TIME	360.0	MINUTES
TOTAL WATER COLLECTED	59.0	GRAMS
MOLECULAR WEIGHT	29.0	LB/LB-MOLE
SAMPLING DUCT AREA	196.00	SQ. FT.
GASEOUS FLUORIDE COLLECTED	0.02349	GRAMS
PARTICULATE FLUORIDE COLLECTED	0.00876	GRAMS
TOTAL FLUORIDE COLLECTED	0.03225	GRAMS
AVG ALUMINUM PRODUCTION RATE	445663	LBS./DAY
VOLUME GAS SAMPLED	261.213	SCF
MOISTURE IN STACK GAS	1.052	%
VELOCITY OF STACK GAS (ACTUAL)	2591	FT./MIN.
VOLUMETRIC FLOWRATE IN DUCT	413588	SCFM
PERCENT ISOKINETIC - TRAIN TO DUCT	98.18	%
GASEOUS FLUORIDE CONCENTRATION	3.175	MG./SCM
GASEOUS FLUORIDE CONCENTRATION	0.001388	GRAINS/SCF
PARTICULATE FLUORIDE CONCENTRATION	1.184	MG./SCM
PARTICULATE FLUORIDE CONCENTRATION	0.000518	GRAINS/SCF
TOTAL FLUORIDE CONCENTRATION	4.359	MG./SCM
TOTAL FLUORIDE CONCENTRATION	0.001905	GRAINS/SCF
TOTAL FLUORIDE EMISSION	6.754	LBS./HR.
AVG. ALUMINUM PRODUCTION RATE	9.28	TON/HR.
TOTAL FLUORIDE EMITTED	0.727	LBS./TON

Magnitude 7 Metals

Stack Sample Results Raw Data Averages

POTROOM LINE 1 BA

Start Date: 4/29/2020 **Stop Date:** 4/29/2020 **Run #:** 1

Traverse Point	Delta P (in. Water)	Delta H (in. Water)	Meter Temperature (in)	Meter Temperature (out)	Static Pressure (in. Water)	Stack Temperature (Deg. F)
B 1-1	0.41	1.50	70	69	-0.42	155
B 1-2	0.50	1.80	70	70	-0.45	157
B 1-3	0.45	1.65	70	70	-0.41	159
B 1-4	0.42	1.55	70	70	-0.40	158
B 2-1	0.61	2.20	73	71	-0.52	163
B 2-2	0.51	1.85	72	71	-0.46	165
B 2-3	0.45	1.60	74	72	-0.42	167
B 2-4	0.47	1.70	74	72	-0.38	166
B 3-1	0.66	2.35	76	73	-0.52	171
B 3-2	0.52	1.85	76	73	-0.48	172
B 3-3	0.45	1.60	77	74	-0.42	172
B 3-4	0.44	1.60	77	74	-0.39	171
B 4-1	0.59	2.10	78	76	-0.61	175
B 4-2	0.55	1.95	78	76	-0.51	174
B 4-3	0.51	1.85	78	76	-0.48	175
B 4-4	0.50	1.80	78	76	-0.46	174
B 5-1	0.52	1.90	79	77	-0.51	173
B 5-2	0.60	0.02	79	77	-0.53	176
B 5-3	0.57	2.10	80	78	-0.49	174
B 5-4	0.43	1.55	80	78	-0.43	171
A 1-1	0.66	2.35	77	76	-0.48	175
A 1-2	0.66	2.35	75	75	-0.46	177
A 1-3	0.56	2.00	76	76	-0.42	179
A 1-4	0.50	1.80	76	76	-0.40	179
A 2-1	0.58	2.05	75	75	-0.45	178
A 2-2	0.58	2.05	76	76	-0.44	178
A 2-3	0.52	1.85	75	75	-0.40	177
A 2-4	0.46	1.65	75	75	-0.40	177
A 3-1	0.46	1.65	75	75	-0.40	176
A 3-2	0.46	1.65	75	75	-0.40	176
A 3-3	0.48	1.70	75	75	-0.44	177
A 3-4	0.46	1.65	75	75	-0.42	177
A 4-1	0.42	1.50	76	76	-0.40	171
A 4-2	0.42	1.50	75	75	-0.36	168
A 4-3	0.40	1.45	75	75	-0.34	162
A 4-4	0.40	1.45	75	75	-0.38	162
A 5-1	0.38	1.40	72	72	-0.34	157
A 5-2	0.38	1.40	72	72	-0.35	158
A 5-3	0.35	1.30	73	73	-0.37	159
A 5-4	0.32	1.10	73	73	-0.35	160
Averages	**Avg. Sq. Rt 0.698**	**1.709**	**74.7**		**-0.43**	**169.8**

AP

Date 4/29/20 — MAGNITUDE 7 METALS LLC

Location PR1 — STACK SAMPLING DATA — Room Initial L.C. @ 15.0 = .004

Room B — COMPLIANCE

Start Time 8:20 — Room Final L.C. @ 5.0 = .005

Run # 1 — Operators

Avg. Tip Diameter .2534 — Joe Schmidt — Digital meter used 2077

Duct Area = 196 sq. ft.

Delta H 1.77 — Initial Pitot L.C. = N.2

2 % Moisture (assumed)

POINT #	SAMP TIME Min.	METER VOLUME Cu. Ft.	DELTA P in. H_2O	DELTA H in. H_2O	METER TEMP F IN	METER TEMP F OUT	STATIC PRESS. in. H_2O	STACK TEMP. ° F	IMP. TEMP. ° F	HEATER BOX TEMP. ° F	PUMP VAC. in. Hg	SET PT.
1-1	9	798.000	.41	1.50	70	69	-.42	155	44	152	.1	3.65
1-2	9		.50	1.80	70	70	-.45	157	45	155	.1	3.64
1-3	9		.45	1.65	70	70	-.41	159	46	155	.1	3.63
1-4	9		.42	1.55	70	70	-.40	158	46	157	.6	3.64
2-1	9	824.000	.61	2.20	73	71	-.52	163	49	154	.2	3.62
2-2	9		.51	1.85	72	71	-.46	165	51	155	.1	3.61
2-3	9		.45	1.60	74	72	-.42	167	50	155	.1	3.60
2-4	9		.47	1.70	74	72	-.38	166	51	155	.1	3.61
3-1	9	852.025	.66	2.35	76	73	-.52	171	52	155	1.0	3.59
3-2	9		.52	1.85	76	73	-.48	172	52	154	.6	3.59
3-3	9		.45	1.60	77	74	-.42	172	53	155	.5	3.59
3-4	9		.44	1.60	77	74	-.39	171	54	153	.5	3.60
4-1	9	880.130	.59	2.10	78	76	-.51	175	55	155	.7	3.57
4-2	9		.55	1.95	78	76	-.51	174	55	155	.7	3.59
4-3	9		.51	1.85	78	76	-.48	175	52	154	.6	3.58
4-4	9		.50	1.80	78	76	-.46	174	54	155	.6	3.59
5-1	9	908.930	.52	1.90	79	77	-.51	173	56	155	.7	3.66
5-2	9		.60	2.20	79	77	-.53	176	55	155	.7	3.64
5-3	9		.57	2.10	80	78	-.49	174	54	155	.7	3.66
5-4	9		.43	1.55	80	78	-.43	171	55	155	.3	3.62
Before LC		937.840										
S/N		W30720					77	7-1	5A	5H		

Nomograph factor: 4.24

MAGNITUDE 7 METALS LLC

STACK SAMPLING DATA

Date 4-29-20 | COMPLIANCE | Room Initial L.C. @ 5.0 = .007

Location Potroom 1

Room A | Operators Chi Allatt | Room Final L.C. @ 5.0 = .006

Stop Time 1443

2 % Moisture (assumed) | Final Pitot L.C. = Nil

POINT #	SAMP TIME Min.	METER VOLUME Cu. Ft.	DELTA P in. H_2O	DELTA H in. H_2O	METER TEMP F IN	METER TEMP F OUT	STATIC PRESS. in. H_2O	STACK TEMP. ° F	IMP. TEMP. ° F	HEATER BOX TEMP. ° F	PUMP VAC. in. Hg	SET PT.
1-1	9	937.930	.66	2.35	77	76	-.48	175	46	155	.1	3.58
1-2	9		.66	2.35	75	75	-.46	177	48	158	.1	3.56
1-3	9		.56	2.00	76	76	-.42	179	50	155	.1	3.56
1-4	9		.50	1.80	76	76	-.40	179	50	155	.1	3.56
2-1	9	967.460	.58	2.05	75	75	-.45	178	52	155	.1	3.56
2-2	9		.58	2.05	76	76	-.44	178	53	155	.1	3.56
2-3	9		.52	1.85	75	75	-.40	177	55	155	.1	3.56
2-4	9		.46	1.65	75	75	-.40	177	56	155	.1	3.56
3-1	9	994.900	.46	1.65	75	75	-.40	176	56	155	.1	3.57
3-2	9		.46	1.65	75	75	-.40	176	56	155	.1	3.57
3-3	9		.48	1.70	75	75	-.44	177	58	156	.1	3.57
3-4	9		.46	1.65	75	75	-.42	177	59	156	.1	3.57
4-1	9	020.974	.42	1.50	76	76	-.40	171	55	155	.1	3.60
4-2	9		.42	1.50	75	75	-.36	168	56	155	.1	3.61
4-3	9		.40	1.45	75	75	-.34	162	54	156	.1	3.65
4-4	9		.40	1.45	75	75	-.38	162	55	156	.1	3.65
5-1	9	045.780	.38	1.40	72	72	-.34	157	55	154	.1	3.66
5-2	9		.38	1.40	72	72	-.35	158	56	155	.1	3.66
5-3	9		.35	1.30	73	73	-.37	159	58	156	.1	3.65
5-4	9		.32	1.10	73	73	-.35	160	58	156	.1	3.65
FINAL		069.004										

Nomograph factor: 4.24

MAGNITUDE 7 METALS, LLC
STACK SAMPLING RAW DATA
METHODS 5 & 13 or METHODS 5 & 315

Location: PR1 Line: 1 Date sampled: 4/29/20 Run: 1 Filter: 14

PITOT TUBE — Circle to document visual inspection.

SN N7052

Visually inspected? (Yes)

PROBE TIP

SN 7

DIAMETER MEASUREMENT (in.)

1. _____
2. .2534
3. _____
4. Avg PR1 PDM
5. _____
6. _____
7. _____
8. _____

If previous calibration referenced, circle (Yes) to document visual inspection.

Out of round max. 0.004 in.

CAL. BY: JS

CALIPER: MITUTOYO S/N 7002015

NORANDA 0.5"

THICKNESS STD # 1 .5000

SAMPLER OPERATION

PROBE HEAT SETTING	HEATER BOX SETTING
248 deg. F. +/- 25 deg. F.	For Method 13
Range: 223 - 273 deg. F.	165 deg. F. +/- 15 deg. F.
	Range: 150 - 180 deg. F.
	For Method 315
	248 deg. F. +/- 25 deg. F.
	Range: 223 - 273 deg. F.

BAROMETER READING 29.55 (in. Hg)

CORRECTION FACTOR -.14 (in. Hg)

For Method 13 only:

ORIGINAL GASEOUS FLUORIDE SAMPLE VOLUME 1 (liter)

		INITIAL WEIGHT	FINAL WEIGHT
IMPINGER #	+ 100 ml water	741.7	774.0
IMPINGER #	+ 100 ml water	745.7	724.5
IMPINGER #	+ EMPTY	635.1	647.2
IMPINGER #	+ SILICA GEL	1131.2	1167.0
IMPINGER #	+ SILICA GEL		
IMPINGER #	+ SILICA GEL		

BALANCE: METTLER PJ6000 SNR K59603 WEIGHED BY: JS

2 Kg Class S-1 Calibration Wt. 2000.0 Balance check must be +/- 0.5 grams.

COMMENTS: _____

Magnitude 7 Metals

GAS ANALYSIS REPORT

Location PR Date 4/29/20

Run 1

Room B Analyzed by JS

Run	Time	Percent Carbon Dioxide (CO_2)	Percent Oxygen (O_2)
1	8:30	1.8	20.5
2	8:40	1.6	21.0
3	8:45	1.8	20.5

Room A Analyzed by CA

Run	Time	Percent Carbon Dioxide (CO_2)	Percent Oxygen (O_2)
1	1200	0.6	20.4
2	1210	0.6	20.4
3	1225	0.5	20.6